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3. To other societies and to individuals. The Société de documentation bibliographique, 2,000 francs; 2,000 francs to Henri Piéron, for the equipment of his laboratory at the Sorbonne for physiological psychology; 2,400 francs to Louis Mengaud, professor at the Lycée of Toulouse, for exploratory work in the province of Santander; 10,000 francs to Charles Marie, for assistance in the publication of tables of physical constants; 3,000 francs to Camille Flammarion, for his private observatory at Juvisy; 4,000 francs to Emile Miège, for experiments at Rennes; 1,000 francs for the preparation of plates illustrating fossils collected by J. Couyat-Barthoux.

The total grants recommended amount to 82,300 francs, and this does not exhaust the sum available. During the war it has been impossible for all the investigators to carry on work already commenced or to undertake new researches, and other expenditure considered desirable by the council has been excluded by the terms of the legacy.

SCIENTIFIC NOTES AND NEWS

IVAN PAVLOV, the eminent Russian physiologist, died at Petrograd at the age of sixty-seven years. In 1904 he was awarded the Nobel prize for medicine.

SIR WILLIAM TURNER, principal of Edinburgh University, distinguished as an anatomist, has died at the age of eighty-three years.

DR. ELMER L. CORTHELL, of New York City, who has had charge of important work in bridge, railway, canal and harbor construction, has been elected president of the American Society of Civil Engineers.

DR. L. D. RICKETTS, president and general manager of the Canadian Consolidated Copper Company, has been elected president of the American Institute of Mining Engineers.

THE Academy of Natural Sciences of Philadelphia has elected as correspondents the following named: William Bateson, Charles E. Barrois, Thomas C. Chamberlin, Carl Diener, Alfred C. Haddon, Wilhelm Ludwig Johannsen, Stanislas Meunier, Albrecht Penck, William Trelease and Samuel W. Williston.

DR. EDWARD BAGNALL POULTON, Hope professor of zoology at Oxford University, has been elected a foreign member of the Swedish Royal Academy of Science.

DR. ALBERT EINSTEIN, of Berlin, has been elected a corresponding member of the Göttingen Academy of Sciences in the section of mathematics and physics.

THE gold medal of the Royal Astronomical Society has been presented to Dr. J. L. E. Dreyer, for his contributions to astronomical history and his catalogues of nebulae.

A GRANT of \$500 from the C. M. Warren Fund of the American Academy of Arts and Sciences has been made to Professor James F. Norris, of Vanderbilt University, for the study of factors which influence the valency of carbon.

C. A. McLENDON, field pathologist of the South Carolina Experiment Station, has accepted a position as expert in cotton breeding with the Georgia State Board of Entomology, Atlanta, Ga.

DR. ALBERT ERNEST JENKS, professor of anthropology in the University of Minnesota, has returned after a leave of absence to study the question of mixed-blood Indians. Congress passed an act in 1907 allowing "mixed-blood Indians" on White Earth Reservation, Minnesota, to sell their lands. In time the government brought suit against citizens of Minnesota to set aside titles to certain lands, under the claim that the Indians who sold such lands were pure-blood Indians, instead of mixed-blood Indians. Dr. Jenks was called to attempt to settle the question of blood status by anthropometric methods. Of the nine court cases tried so far with anthropological evidence the court has held that the sellers in eight cases were mixed-blood Indians.

DR. H. L. SHANTZ, of the Bureau of Plant Industry, delivered the annual address before the local chapters of Sigma Xi and Phi Beta Kappa at the University of Nebraska on the evening of February 12, 1916. The subject of the illustrated lecture was: "Water as a Factor in Plant Growth."

PROFESSOR DOUGLAS W. JOHNSON, of Columbia University, on February 11 addressed the United States Naval War College at Newport, Rhode Island, on "Topographic Features of Europe as a Factor in the War."

At the regular monthly meeting of the Cosmos Club, Washington, Dr. Charles Waddell Stiles delivered an address on "Some Medical Aspects of the Race Question in the South, with Special Reference to the Hookworm."

DR. JULIUS NELSON, professor of biology at Rutgers College and state biologist, died suddenly at his home in New Brunswick, N. J., on February 16, from pneumonia. He was born in Copenhagen, Denmark, in 1858. He was a graduate of Wisconsin University, and received the doctorate of philosophy from the Johns Hopkins University. Dr. Nelson had been a professor at Rutgers since 1888.

DR. JOHN WYLLIE, appointed professor of medicine in the University of Edinburgh in 1900, in succession to Sir Thomas Grainger Stewart, and retired owing to ill health in November, 1914, died on January 27.

THE death has occurred at Copenhagen of Dr. Friedrich Krüger, director of the astronomical observatory at Aarhus.

DR. J. C. MÖBERG, professor of geology at Lund, has died at the age of sixty-one years.

THE U. S. Civil Service Commission announces an examination on March 21, for fish pathologist, for men only, to fill a vacancy at \$2,500 per annum, in the Bureau of Fisheries, Department of Commerce. The duties of the fish pathologist are primarily to investigate the nature and the effects of diseases of fish or shellfish, physiological or environmental conditions associated with the development of pathological phenomena, and the means of prevention or cure. The investigation of stream pollution is involved as well as the study of the physical, chemical and biological conditions that may be salutary or deleterious to fish. Competitors will not be assembled for examination, but will be rated on education, experience and publications or thesis. Graduation with a bachelor's degree from a course in

a college or university of recognized standing, and in addition at least one year of post-graduate work or the equivalent in chemistry or biology, are prerequisites.

ACCORDING to information received via Buenos Aires, the magnetic-survey vessel *Carnegie*, under the command of Captain J. P. Ault, arrived at South Georgia Island on January 12, having made magnetic observations daily since her departure from Lyttelton, New Zealand, on December 6. Icebergs were encountered on nine days during the trip. The *Carnegie* sailed again on January 14, in continuation of her circumnavigation of the region between the parallels 50° and 60° south.

WE learn from *Nature* that there is now at the London Library a small but very interesting exhibit of early printed books on astronomy, from the collection of Mr. Gilbert R. Redgrave. Many of them are from the press of Erhard Ratdolt, whose fine work at Augsburg and Venice is so well known. There is a splendid copy of a "Kalendar" by Monteregio (otherwise Regiomontanus), in Italian, and an even finer one in Latin, both printed by Ratdolt at Venice in 1476—works now of great rarity. There is also a very rare folio tract by the same author, "Universis Bonarum Artium Studi," printed at Nuremberg in 1476. These appear to be in absolutely perfect condition. Among other fifteenth-century books mention may be made of a fine copy of Hyginus, "Poeticon Astronomicum," of 1487, as well as the less rare edition of 1448. The diagrams of eclipses, etc., are frequently colored—some by hand and some printed in colors. Two works of later date, but of special interest, are Galileo's "Istoria e dimostrabioni," of 1613, describing the newly discovered spots on the sun, and announcing the configurations of Jupiter's satellites, and his "Dialogo" on the Ptolemaic and Copernican systems, which occasioned his condemnation by the Inquisition. The only English book is a fine copy of the first edition of Newton's "Principia" (1687).

THE determination of the amount of water flowing in the streams of the Rio Grande basin, which covers the greater part of New

Mexico, large areas in southern Colorado, and a considerable territory in Texas and old Mexico, is of unusual importance to that region, for most of it is an arid agricultural country, entirely dependent on its streams for irrigation. Water Supply Paper 388, just issued by the United States Geological Survey, contains records for 1914 of the discharge of the Rio Grande and its principal tributaries, together with that of Colorado River of Texas and Brazos River. Systematic study of run-off in the Rio Grande basin was begun by the federal government near Embudo, New Mexico, soon after the passage of the act of October 2, 1888, which authorized the organization of the irrigation survey under the direction of the United States Geological Survey. A camp of instruction for hydrographers was established near Embudo, and at this camp and the gaging station near by the methods of stream measurement now in general use were systematized. In the spring of 1889 additional stations were established on the Rio Grande near Del Norte, Colo., and El Paso, Tex. From this beginning the work of measuring the waters of the Rio Grande basin has been expanded until there are now 40 gaging stations on the Rio Grande and its tributaries, Colorado River of Texas and Brazos. The report contains not only all data concerning stream flow collected in the western Gulf of Mexico basin by the survey and cooperating parties but also records furnished by private individuals and corporations. All stations in New Mexico were maintained in cooperation with the state. The United States Reclamation Service furnished a large part of the money expended in the lower Pecos River valley and also rendered assistance in the Rio Colorado, Rio Hondo and Rio Taos drainage basins. The United States Forest Service and the Indian Office also aided in the collection of data.

THE thirty-sixth Annual Report of the Director of the United States Geological Survey, just made public, emphasizes its scientific and economic activities. The survey investigations cover every branch of the mineral resources of a country whose mineral re-

sources are the greatest in the world. The work of the survey is conducted under three scientific branches and includes three corresponding kinds of activity. Under the geologic branch, investigations are made concerning the mineral resources of the entire United States and Alaska, ranging from truly exploratory surveys of regions practically unknown to white men to the most detailed geologic examination of mining camps. Last year 76,000 square miles were thus geologically examined. Work of the survey that is even more of a pioneer type, however, is done by the topographic engineers, who have made surveys during the year in 30 states as well as in Alaska and Hawaii. The survey's topographic map is the base or mother map of the United States. The other scientific branch of the survey is that which conducts investigations of water resources, including the measurement of the volume of the important rivers of the country and their tributaries, as well as the study of underground water resources. Stream measurements are carried on from year to year, and the engineering data thus obtained are used in all kinds of hydraulic engineering, such as projects involving power, irrigation, drainage, and flood prevention. Another feature of the Geological Survey's work is the collection and publication of mineral statistics. Survey geologists are in correspondence with some 90,000 miners, mine operators, and mineral producers, whose output covers all the useful minerals, and the data thus obtained are published by the Survey in reports on seventy-five subjects. The total appropriation provided by Congress for the Geological Survey during the current year is approximately \$1,500,000.

IN the joint statement given out by the United States Geological Survey and the Bureau of the Mint the value of new gold added to the home supply from mills and smelters operating on domestic ores (including those of Alaska, the Philippines and Porto Rico) in 1915 was \$98,891,100. This shows the substantial increase of \$4,359,300 over the output of \$94,531,800 in 1914, and was within \$782,300

of the record production of \$99,673,400 in 1909. The gold-mining industry was generally prosperous again in 1915, according to figures compiled by H. D. McCaskey, of the United States Geological Survey, from preliminary reports received from the mines. Estimates made from these figures, which represent ores sold or treated during the year, as distinguished from the metal actually produced, show that the output was even higher, and that it approached, if it did not actually pass, the \$100,000,000 mark; but some of the ore and concentrates produced from the mines and mills can not be smelted until 1916, and the refined gold did not become available for consumption in 1915. An increase in the yield of gold is indicated by the mine returns from every important gold-mining state, and a decrease is reported only from Washington, while the output of Idaho remains the same. The principal increases were nearly \$2,500,000 in Colorado, over \$2,200,000 in California, over \$1,100,000 in Alaska, over \$800,000 in Montana, nearly \$650,000 in Utah, over \$480,000 in Nevada, and over \$300,000 in New Mexico. Smaller increases were reported from Oregon, South Dakota and Arizona. California retained first rank in 1915, with an output of about \$23,000,000, and was followed by Colorado, with over \$22,000,000; Alaska, with nearly \$17,000,000; Nevada, with nearly \$12,000,000; South Dakota, with over \$7,000,000; Montana, with nearly \$5,000,000; Arizona, with over \$4,000,000; Utah, with over \$3,500,000; Oregon, with nearly \$2,000,000; New Mexico, with nearly \$1,500,000; and Idaho and the Philippines, with about \$1,200,000 each.

PRELIMINARY estimates of the total yield of petroleum for 1915 indicate a slight increase over the record-breaking yield in 1914. This condition does not agree with the currently reported reason for the exceptionally high prices now prevailing for motor fuel. As a result of the over-load put on the transporting and refining phases of the petroleum industry by the excess output of crude petroleum in 1914, the year 1915 may be characterized as a period of readjustment in which production activity was purposely retarded as far as practicable. The

small increase therefore is more significant than the simple figures suggest. According to John D. Northrop, of the United States Geological Survey, the marketed production of petroleum in the United States in 1915 approximated 267,400,000 barrels, and the total yield approximated 291,400,000 barrels, about 24,000,000 barrels of oil brought to the surface during the year being placed in field storage by the producers. The following table shows by states the marketed production of petroleum in 1914 and an estimate of the corresponding production in 1915, in barrels:

States	1914	1915
California	99,775,327	89,000,000
Oklahoma	73,631,724	80,000,000
Texas	20,068,184	26,000,000
Illinois	21,919,749	18,500,000
Louisiana	14,309,435	18,500,000
West Virginia	9,680,033	9,000,000
Pennsylvania	8,170,335	8,700,000
Ohio	8,536,352	7,900,000
Wyoming	3,560,375	4,200,000
Kansas	3,103,585	3,000,000
Indiana	1,335,456	1,000,000
New York	938,974	900,000
Kentucky	502,441	450,000
Colorado	222,773	200,000
Other states	7,792	50,000
	<u>265,762,535</u>	<u>267,400,000</u>

SECRETARY OF COMMERCE REDFIELD has addressed to the Secretary of the Navy the following letter relative to the success of the Bureau of Standards in developing a radio-direction finder.

Recent quotations in the press from your letter to the Senate Committee on Naval Affairs give part of a report from Admiral Fletcher in which it is said that among the needs of the navy is a radio-direction finder. The Bureau of Standards has been investigating this subject for some time and has developed an instrument which is simple and practical and at the same time very efficient in operation. It indicates the direction of the source at the same time that the messages are being received, and while it is very sensitive to radiations in a given direction it is less affected by atmospheric disturbances and interfering radiations from other directions than an ordinary receiving apparatus. We have received messages by one or another of the three sizes of instru-

ments that have been built from Philadelphia, Boston, Glace Bay, Newcastle (N. B.), New York, Norfolk, New Orleans, Panama, Key West, San Diego and Hanover, Germany. When atmospheric disturbances have been very pronounced on the large antenna at the West Laboratory, they have been very slight on the direction finder apparatus, which is entirely indoors, having no antenna or earth or other outside connection. This apparatus appears to be well adapted to use (*a*) on merchant and naval ships to obtain the direction from any lighthouses or lightships that may be equipped with radio fog signaling apparatus, (*b*) to obtain the direction of one ship from another at sea, (*c*) to communicate between ships or ship and shore stations irrespective of direction by reducing interference and atmospherics, (*d*) to use by the War Department in field service, as the receiving apparatus is portable and requires no ground or antenna, and can be carried readily in a light vehicle or even by a single observer, (*e*) to use by the Coast Guard Service to receive distress signals and locate the direction, (*f*) for use by the Bureau of Navigation to locate amateur or other stations that are not observing the radio regulations or are otherwise interfering with radio-transmission of the government or legitimate commercial business. The Bureau of Standards is prepared to demonstrate the apparatus to representatives of the War and Navy Departments or other interested departments at any time desired.

UNIVERSITY AND EDUCATIONAL NEWS

AN anonymous gift of \$10,000 for surgical research at Columbia University has been announced by the trustees.

MORSE HALL, erected in 1890 and containing Cornell University's valuable chemical laboratories and scientific equipment, was destroyed by fire on February 13. The loss is estimated at \$300,000, partly covered by insurance. The cause of the fire has not been determined.

THE board of trustees of the Ohio State University have ratified the proposal made by President W. O. Thompson for the establishment and maintenance of research professorships. The plan provides that men of recognized ability may be relieved from teaching to devote their entire time to scientific research.

DR. GORHAM BACON has tendered his resignation as professor of otology in the College of Physicians and Surgeons, Columbia University, to take effect at the close of the present academic year.

To fill the vacancy caused by the resignation of Dr. William J. Means, dean of the College of Medicine of the Ohio State University, Dr. Eugene F. McCampbell, secretary of the state board of health, has been appointed to the deanship.

DR. WALDEMAR SCHLEIPP, associate professor of zoology at Freiberg, has been called to the chair of comparative anatomy at Würzburg, vacant by the death of Th. Boveri.

DISCUSSION AND CORRESPONDENCE

SCHOOL AND THE LONG VACATION

THERE is a widespread belief shared by those working in the pedagogic field and those on the outside that something is radically wrong with our educational methods. The results achieved in schools and colleges are in no way proportionate to the native intelligence, the expenditure of effort in teaching and the stupendous outlay of money represented by material equipment and cost of maintenance. Employers of labor in stores, shops and factories complain of the lack of training and efficiency in the young men and women available for hire, and college teachers of sound judgment seem quite generally convinced that the average student at the end of his four-years' course has not enough to show in cultural attainments and useful knowledge. As I have intimated, this disappointing result is not due to lack of ability on the part of the American youth, who for quickness of perception and capacity of learning are not outclassed by the youth of any nation. The fault lies elsewhere. It would carry me too far from my present purpose were I to enter upon a discussion of all the defects of our system. I intend dealing with one only, a definite concrete condition easily comprehended and fully remediable if once educators are impressed with its significance.